REMARKS

With the addition of claim 41, claims 21 to 41 are pending in the present application. Applicants respectfully submit that the pending claims are patentable for the following reasons and reconsideration is respectfully requested.

Applicants thank the Examiner for acknowledging the receipt of the previously submitted Information Disclosure Statement and PTO-1449, as well as consideration of the references cited therein as indicated in the Office Action Summary.

Applicants thank the Examiner for acknowledging a claim for foreign priority under 35 U.S.C. §119(a)-(d) or (f) and that all certified copies of the priority documents have been received as indicated in the Office Action Summary.

I. OBJECTION OF CLAIMS 26 AND 34 UNDER 37 C.F.R. §1.75(d)(1)

Claims 26 and 34 are objected to under 37 C.F.R. §1.75(d)(1). The Office Action suggests wording for the claims to overcome the objection.

Applicants have amended claims 26 and 34 to correct the grammatical errors. Applicants respectfully submit that the amendments to claims 26 and 34 have rendered the objections to the claims moot. Applicants respectfully requests withdrawal of the objection to claims 26 and 34.

II. REJECTION OF CLAIMS 26 AND 35 UNDER 35 U.S.C. §112 SECOND PARAGRAPH

Claims 26 and 35 were rejected under 35 U.S.C. §112, second paragraph as allegedly being vague and indefinite to particularly point out and distinctly claim the subject matter which the applicants regard as the invention.

Although not necessarily agreed with, in order to further prosecution, applicant has amended claims 26 and 35 such that the claim terminology removes alternate recitations for the features found objectionable. Applicants respectfully requests withdrawal of the rejections to claims 26 and 35.

III. REJECTION OF THE CLAIMS UNDER 35 U.S.C. §101

The Office Action rejects the claims under 35 U.S.C. §101 and states that the claimed invention is directed to non-statutory subject matter. The Office Action states the MPEP Section 2106(IV)(B)(2)(b)(ii) prevents such claims as there is no useful, concrete and tangible result.

Applicants respectfully traverse the rejection of the claims under 35 U.S.C. §101. Applicants respectfully submit that determination of an operational parameter for use in controlling a nuclear reactor is clearly a useful technology and the tangible results that are achieved through this operational parameter result in operational safety of the nuclear reactor. Applicants furthermore submit that as provided in MPEP 2106 and in accordance with AT&T Corp v. Excel Communications Inc, 172 F.3d 1352, 1358 "Transformation of data, representing discrete dollar mounts, by a machine through a series of mathematical calculations into a final share price, constitutes a practical application of a mathematical algorithm, formula or calculation, because it produces "a useful, concrete and tangible result". Applicants respectfully submit the method of claim 21 produces an analogous situation and that a useful, concrete and tangible result, is achieved. In the present invention, and specifically in claim 21, the invention takes the form of a limit value for an operational parameter, which helps in optimizing the control of a nuclear reactor.

Applicants further respectfully traverse the rejections of claims 39 and 40 which clearly claim **articles of manufacture**, and not a method. As recited in these claims, an article of manufacture is claimed, comprising an arrangement configured to perform the steps of a method for establishing at least a limit value (tmax) for at least a first operational parameter of a nuclear reactor having a core, in which fuel assemblies are loaded, the fuel assemblies having fuel rods each comprising pellets of nuclear fuel and a cladding which surrounds the pellets the method comprising, simulating at least a transient operational occurrence of the nuclear reactor, calculating a value reached by a physical quantity during the transient operational occurrence in at least the fuel rod cladding; and establishing as a limit value, the value of the first operational parameter when the value calculated by the physical quantity corresponds to a value for the physical quantity which

characterizes a failure of the cladding. Such arrangements are patentable subject matter and are not analogous to the Office Action attempted equivalency of a mathematical algorithm that models acoustical noise.

Applicants have added claim 41 that recites the method of claim 21 but further comprises operating the reactor using the limit value, such that failure of the cladding does not occur. Claim 41 recites carrying out further operating steps that cause physical transformation of materials outside of numerical calculations. Applicants respectfully submit that claim 41 provides a useful, concrete and tangible result. Moreover, claim 41, requires that there be a physical transformation outside the computer for with a practical application in the technological arts is disclosed in the specification. In accordance with MPEP 2106 IV 2(b) Statutory Process Claims, claim 41 satisfies the requirements provided in Cochrane v. Deener, 94 U.S. 780, 787 (1877) and should therefore be considered patentable subject matter.

Applicants respectfully request withdrawal of the rejection under 35 U.S.C. §101.

IV. REJECTION OF CLAIMS 21 TO 25 AND 37 TO 40 UNDER 35 U.S.C.§102(b)

Claims 21 to 25 and 37 to 40 were rejected under 35 U.S.C. 102(b) as allegedly being anticipated by United States Patent 5,912,933 ("Shaug et al."). Applicants respectfully submit that the Shaug et al. reference does not anticipate claims 21 to 25 and 37 to 40 for the following reasons.

Claim 21 relates to a method for establishing at least a limit value for at least a first operational parameter of a nuclear reactor having a core, in which fuel assemblies are loaded, the fuel assemblies having fuel rods each comprising pellets of nuclear fuel and a cladding which surrounds the pellets the method comprising: simulating at least a transient operational occurrence of the nuclear reactor, calculating a value reached by a physical quantity during the transient operational occurrence in at least the fuel rod cladding; and establishing as the limit value, the value of the first operational parameter when the value calculated for the physical quantity corresponds to a value for the physical quantity which characterizes a failure of the cladding.

Claim 37 relates to a system for establishing at least a limit value for an operational parameter of a nuclear reactor, comprising: an arrangement to simulate at least a transient operational occurrence of the nuclear reactor; an arrangement to calculate a value reached by a physical quantity during the transient operational occurrence in at least the fuel rod cladding; and an arrangement to establish as a limit value, the value of the first operational parameter when the value calculated by the physical quantity corresponds to a value for the physical quantity which characterizes a failure of the cladding.

Claim 39 relates to an article of manufacture, comprising an arrangement configured to perform the steps of a method for establishing at least a limit value for at least a first operational parameter of a nuclear reactor having a core, in which fuel assemblies are loaded, the fuel assemblies having fuel rods each comprising pellets of nuclear fuel and a cladding which surrounds the pellets the method comprising, simulating at least a transient operational occurrence of the nuclear reactor, calculating a value reached by a physical quantity during the transient operational occurrence in at least the fuel rod cladding; and establishing as a limit value, the value of the first operational parameter when the value calculated by the physical quantity corresponds to a value for the physical quantity which characterizes a failure of the cladding.

As regards this anticipation rejection, to reject a claim as anticipated the Office must demonstrate that each and every claim feature is identically described or contained in a single prior art reference. (See, *Scrips Clinic & Research Foundation v. Genentech, Inc.*, 18 U.S.P.Q.2d 101, 1010 (Fed. Cir. 1991)).

Applicants respectfully submit that the Shaug et al. reference discloses a method for determining an operating limit minimum critical power ratio in order to ensure that operation of the nuclear core is maintained in a nucleate boiling field instead of the transition boiling or flux boiling fields. Applicants respectfully submit that this is described in column 1, lines 15 to 20 of the Shaug et al. reference. To achieve this method, histograms of probability calculations representing the number of fuel rods subject to boiling transition are calculated. As provided at the bottom of column 3 and at the top of column 4 in the Shaug et al. reference, instead of an operating limit minimum

critical power ratio parameter, other parameters could be used, for example the critical heat flux in a pressurized water reactor or LMCR or the maximum fuel temperature or the maximum fuel cladding temperature limit.

Applicants respectfully submit that this sentence, however, does not refer to the failure of a fuel rod cladding. The description only intends to determine the temperature of the cladding which is the limit between the nucleate boiling field in the transition of boiling field as described in column 1, lines 15 to 20. The Shaug et al. reference, therefore, merely teaches calculating for the passage from the nucleate boiling state to a transition boiling state in order to establish a limit value for operating parameters for the reactor and does not disclose or teach any limit value that can be used or established for the failure of the cladding of a nuclear fuel rod as provided in the above claims. As the cited reference does not disclose or even suggest applicability to fuel rod cladding, applicant respectfully submits that the Shaug et al. reference does not anticipate independent claims 21, 37 and 39.

Claims 22 to 25 depend from claim 21 and therefore include all of the features of independent claim 21. Claim 38 depends from claim 37 and therefore includes all of the features of independent claim 37. Claim 40 depends from claim 39 and therefore includes all of the features of independent claim 39. Applicant respectfully submits that claims 22 to 25 are patentable for at least the reasons provided above in relation to independent claim 21. Applicants further submit that claim 38 is patentable for at least the reasons provided above in relation to independent claim 37. Applicants also submit that claim 40 is patentable for at least the reasons provided above in relation to claim independent claim 39. Applicant respectfully requests withdrawal of the rejection to claims 21 to 25 and 37 to 40.

V. ALLOWABLE CLAIMS

Applicant notes with appreciation that claims 26 to 36 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form to include all the limitations of the base claim and any intervening claims.

As provided above, applicants respectfully submit that the independent claims are patentable as recited above and therefore claims 26 to 36 are similarly patentable.

VI. CONCLUSION

In view of the foregoing, it is respectfully submitted that all pending claims of the present application are now in condition for allowance. Prompt reconsideration and allowance of the present application are therefore earnestly solicited.

Respectfully submitted,

KENYON & KENYON LLP

Dated: Nov 27, 2006

John M. Vereb
Reg. No. 48,912

One Broadway.
New York, NY 10004

(212) 425-7200 (telephone)

CUSTOMER NO. 26646